

Epidemiological Study of Recent Fractures of the Leg in Children at the Albert Royer National Children's Hospital Center

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Abstract: Objective: The aim of our study is to report the epidemiology of leg fractures in children to CHNEAR. Patients and Method: this was a descriptive retrospective study conducted from January 1 to 2019 to May 31, 2021, i.e. 29 months. Different epidemiological parameters were studied. Results: we collected 65 records of leg fractures in children. Patients under 5 years old were the most affected. The direct mechanism accounted for 72% of leg fractures. Public road accidents accounted for 49.23% of the circumstances of occurrence. The fractures were mainly located at the lower 1/3. Patients consulted directly in 63% of cases. The tibia was involved in 52% of cases. The fracture lines were transverse in 56.92%, oblique in 19.92%. The fractures were displaced in 43.07% of cases. We noted 25 cases of child-specific fractures, i.e. 41.66%. Associated lesions were found in 19 children, i.e. 29.23% of patients. Conclusion: fractures most often occur in boys who are victims of a road accident or a domestic accident. The majorities of fractures are not displaced and sit in the distal third.

Keywords: fracture, leg, child

1. Introduction

Leg fractures represent the third fracture location in children [1]. They are dominated in frequency by lesions in the middle third and in severity by proximal lesions [1]. Their mechanism is generally direct [2]. The diagnosis is suggested on the clinical examination which finds pain, swelling, functional impotence and completed by a standard x-ray of the leg which allows the diagnosis to be made in the majority of cases [3]. Orthopedic treatment is used in the majority of cases and is often limited to a circular cruropedial cast [3]. Surgical treatment is rarely indicated and it is essentially a device.

2. Patients and Method

This was a descriptive retrospective study from January 1st 2019 to May 31st 2021, i. e. 29 months, including children from 0 to 15 years old with a leg fracture not exceeding 21 days. In our study we took into account the frequency of leg fractures in relation to leg trauma and in relation to all fractures diagnosed during the same period, the origin modeled on the departments of Dakar and the other regions of Senegal, the age, the mechanism and circumstances of occurrence, the consultation period, the time of occurrence of the accident divided into time slots, the existence of home or traditional treatment, the mode of admission, the side affected, affected bone, location, displacement or not of the fracture, fracture line displacement, fractures similar to those of adults and fractures specific to children, associated lesions. The data thus collected was entered and analyzed on Microsoft

Excel 2013.

3. Results

Between January 1, 2019 and May 31, 2021, i. e. 29 months, we collected 65 cases of leg fractures in children in the pediatric surgery department of the Albert Royer National Children's Hospital. This figure represented 61.2% of leg injuries and 4.81% of all fractures in children. Children from Dakar-ville accounted for 57% of cases. The average age of the children was 6.1 years with extreme ages of 6 months and 14 years. The age group from 0 to 5 years accounted for 50.7% of cases. Figure 1 shows the distribution of leg fractures by age group.

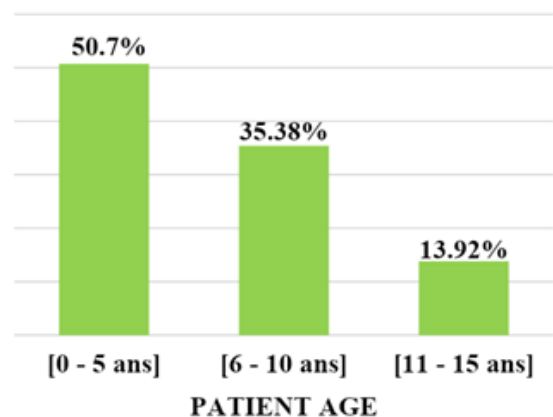


Figure 1: Distribution of leg fractures by age group

Our study population was composed of 48 boys (74%) and

17 girls (26%) representing a sex ratio of 2.8. School children were affected in 55.39% of cases.

The direct mechanism represented 72% of leg fractures and the indirect mechanism 28%.

In our series, public road accidents represented 49.23% of the circumstances of occurrence and domestic accidents 29.23% of cases (Figure 2).

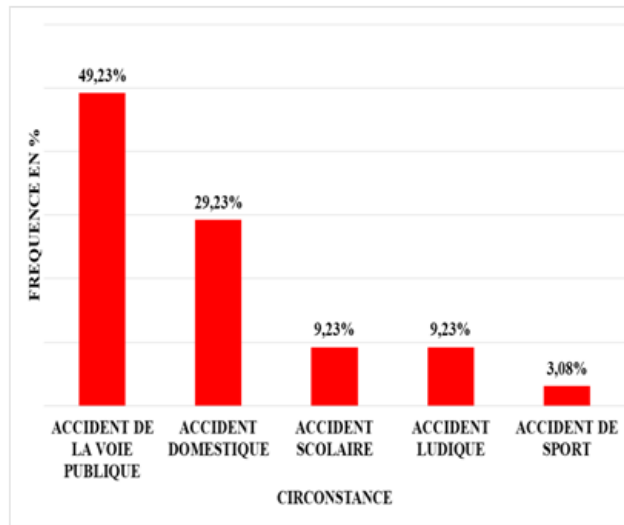


Figure 2: Distribution of leg fractures according to the circumstances of occurrence

The average consultation time was 44 hours with extremes of one hour and 21 days. Leg fractures occurred in 63.08% of cases between 1 p. m. and 7 p. m.

Patients received home treatment in 25% of cases.

Patients received traditional treatment in 23% of cases. These treatments were massage type in 10 cases, mystical

bath in 8 cases, makeshift splint in 4 cases, herbal medicine in 2 cases. Patients consulted directly in 63% of cases and were referred in 37% of cases to the CHNEAR pediatric surgery department. The right leg was affected in 54.44% of cases and the left leg in 45.56% of cases. No bilateral fracture was noted. The tibia was involved in 52% of cases. Table I represents the frequency of fractures on the different bones of the leg.

Table 1: Frequency of fractures on the different parts of the leg

Bone Affected	Percentage	Number	Size N=65
Tibia alone	34	65	52.3%
Tibia + fibula	38.5%	25	65
Fibula alone	9.2%	6	65

The fracture lines were transverse in 56.92%, oblique in 19.92%.

Figure 2 represents the distribution of leg fractures according to the fracture line.

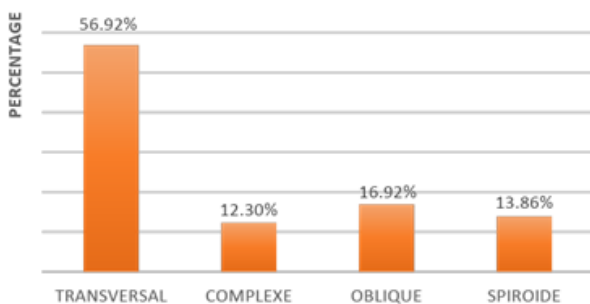


Figure 3: Distribution of leg fractures according to fracture line

The fractures were displaced in 28 cases or 43.07% and not displaced in 37 cases or 56.93%. These displacements

were in translation in 70% of cases, in angulation in 19% of cases and in overlapping in 11% of cases. The fractures were located in the lower third in 48.58% of cases for isolated fractures of the tibia and in 66.66% of cases for those isolated of the fibula.

Simultaneous fractures were located in the lower third of the leg in 62.51% of cases. Table VI represents the distribution of fractures of the two bones according to location.

Table 2: Distribution of fractures of both bones according to location

Location	Percent	Number
Lower 1/3	62.51%	15
Medium 1/3	7	29.16%
Proximal 1/3	8.33%	2
TOTAL	24	100%

We noted 25 cases of fractures specific to children, i.e.

41.66%, and 40 cases of fractures common to adults, i.e. 58.34%. Associated lesions were found in 19 children, i.e.

29.23% of patients. These 19 children presented 23 associated lesions (table VIII).

Table 3: Lesions associated with leg fractures

Other Injuries	Number
Dermabrasion	3
SH epiphyseal detachment fracture: Type II of the tibia	2
Butter clod fracture tibia	2
TCE	2
Medial malleolus fracture	1
Butter lump fracture of the fibula	1
Foot fracture	2
Polytrauma	1
Cutaneous opening (open fracture)	9
Total	23

4. Discussion

Fractures are the most common injuries to the leg. However, they represent only less than 5% of child fractures at the Albert ROYER hospital during our study period. The frequency reported by **Mbaye** [1] in 2014 is triple that found in our work. In **Mbaye's study** [1], which covered the period from 2010 to 2012, there were certainly many more children seen at Aristide Le Dantec hospital because the CHNEAR surgery department had just opened.

The average age found in our study is similar to the age found by **Mbaye** [1]. The age group from 0 to 5 years is mainly affected by leg fractures. Our result differs from those of **Mbaye** [1] in Dakar and **Kanouté** [4] in Mali where the age groups of 6 to 10 years and 10 to 15 years are respectively the most affected.

The male sex is largely in the majority in our study. These results are in agreement with other studies [2]. This male predominance could be explained by the fact that boys are more turbulent and tend to take more risks than girls. In addition, girls are often confined to household chores in Senegal.

In our work preschoolers, so supposed to stay at home, have more leg fractures. At the same time, we note that AVPs are the greatest providers of leg fractures. This discordant result may be linked to the fact that small children play around the house, which is the passageway for many vehicles.

In our study, the children are received at the hospital on average two days after the leg fracture. Our average consultation time is identical to those found by **Mbaye** [1] in Dakar and **Diarra** [6]. in Mali. This delay in consultation in African series could be linked to a factor specific to our socio-cultural environment, which is the first-line recourse to traditional medicine.

In our study, AVP represent half of the circumstances of occurrence of leg fractures in children. This result agrees with data from the literature [24, 31, 33]. This could be explained by the growing increase in two-wheeled vehicles, the non-respect or ignorance of the highway code by users, the insufficiency of road signs, the lack of vigilance and assistance from children. when crossing

roads, using the street as a playground.

The right leg is mainly affected compared to the left leg. The same result is found by **Mbaye**

[1] in Dakar and **Pascale** in Mali [36]. On the other hand **Kanouté** [4] in Mali finds predominance on the left. We have not found an explanation for this difference.

Isolated involvement of the tibia is preponderant. It constitutes a little more than half of leg fractures. It is followed by simultaneous damage to the tibia and the fibula, which occurs in just over a third of cases. As for the attack isolated from the fibula it is rare because it occurs in a little less than 10% of the children. These results have already been mentioned in the work of **Mbaye** [1] in Dakar.

The transverse fracture line largely predominates. This result has already been reported by **Mbaye** [1] in Dakar as well as by **Chotel** [5] in France. According to **Touria** [16], this could be explained by the frequency of direct shock fractures, which is the case in our study.

The majority of leg fractures are not displaced. This could be related to the low velocity of trauma. Displaced fractures are essentially fractures with translational displacement in more than 2/3 of cases. All displacements are represented except those in rotation. **Mbaye** [1] in Dakar also found a predominance of non-displaced fractures with however a higher percentage of 71.8%. We can therefore say that in Dakar leg fractures in children are mostly non-displaced.

Isolated fractures of the leg, whether of the tibia or the fibula, are mainly located in the middle and distal thirds of these bones. In decreasing order of frequency, fractures of the distal third of the leg predominate, followed by fractures of the middle third and then fractures of the proximal third. It should be noted that these are exceptional in comparison to fractures of the distal third and middle third which are almost equivalent. These results are similar to those of **Ferlic** [9] in Austria. However, **Mbaye** [1] in Dakar and **Kanouté** [4] in Mali report a higher frequency of fractures of the middle third followed by fractures of the distal third in both isolated fractures of the tibia and the fibula. .

For the other types of fractures specific to children, green stick fractures come largely in the lead because they represent nearly 70% of fractures specific to children; they are followed in descending order by subperiosteal fractures and plastic fractures. **Mbaye** [1] reports a predominance of green stick fractures. On the other hand, the latter are followed by plastic fractures and then hair fractures.

Lesions associated with leg fractures are rare in children. In our series, they constitute a little less than 30% of the cases, knowing that some children presented several lesions at the same time. The frequency is identical to that found by **Mbaye** [1] in the same city. They are mainly made up of bone lesions located in the border regions of the leg: metaphysis, ankle, and foot, not forgetting the cutaneous opening, which represents nearly half of the children with an associated lesion. This result agrees with data from the literature [14, 17]. However **Debbagh** [7; 12; 18] in Morocco reports a predominance of head trauma

Conclusion: fractures most often occur in boys who are victims of a road accident or a domestic accident. The majorities of fractures are not displaced and sit in the distal third.

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